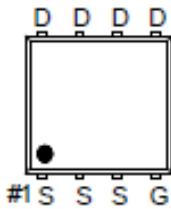


# P2003BEA

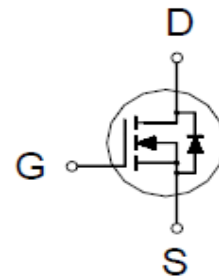
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
30V	20mΩ @ $V_{GS} = 10V$	25A



PDFN 3X3S



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	±20	
Continuous Drain Current	$T_c = 25\text{ °C}$	$I_D$	25	A
	$T_c = 100\text{ °C}$		16	
	$T_A = 25\text{ °C}$		8	
	$T_A = 70\text{ °C}$		6	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	60	
Avalanche Current		$I_{AS}$	17	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	15	mJ
Power Dissipation	$T_c = 25\text{ °C}$	$P_D$	20	W
	$T_c = 100\text{ °C}$		8	
	$T_A = 25\text{ °C}$		2	
	$T_A = 70\text{ °C}$		1.3	
Operating Junction & Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	°C

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE		SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	Steady-State	$R_{\theta JA}$		60	°C / W
Junction-to-Case	Steady-State	$R_{\theta JC}$		6	

<sup>1</sup>Pulse width limited by maximum junction temperature.

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## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

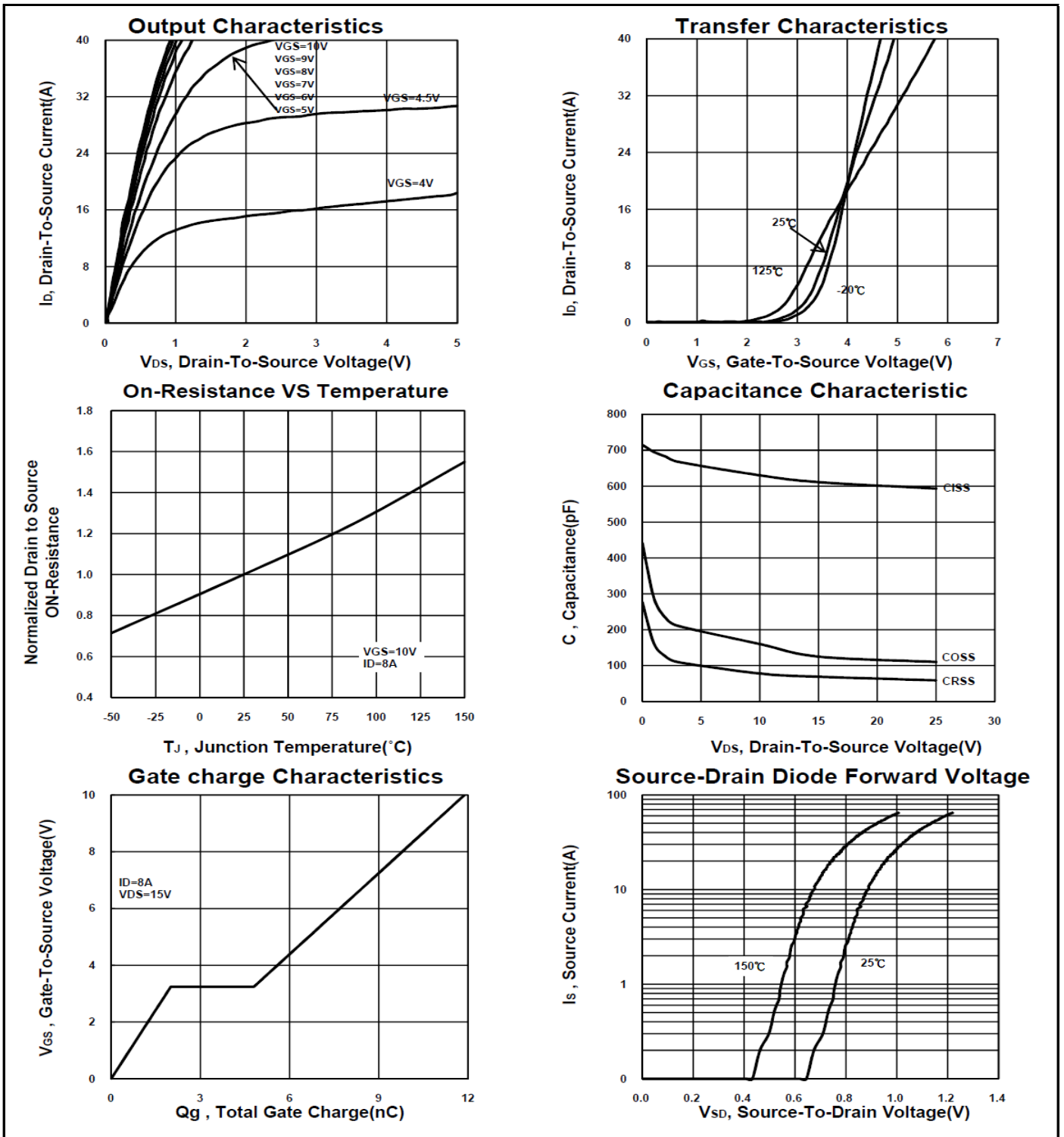
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	1.8	2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V			1	μA
		V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55 °C			10	
On-State Drain Current <sup>1</sup>	I <sub>D(ON)</sub>	V <sub>DS</sub> = 5V, V <sub>GS</sub> = 10V	60			A
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A		28.2	31	mΩ
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 8A		17.6	20	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 8A		16		S
<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz		625		pF
Output Capacitance	C <sub>oss</sub>			130		
Reverse Transfer Capacitance	C <sub>rss</sub>			73		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		2.6		Ω
Total Gate Charge <sup>2</sup>	Q <sub>g</sub> (V <sub>GS</sub> =10V)	V <sub>DS</sub> = 0.5V <sub>(BR)DSS</sub> , I <sub>D</sub> = 8A		12.1		nC
	Q <sub>g</sub> (V <sub>GS</sub> =4.5V)			6.3		
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			2.1		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			3.1		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>		V <sub>DD</sub> = 15V, I <sub>D</sub> ≅ 8A, V <sub>GEN</sub> = 10V, R <sub>G</sub> = 3Ω		12	
Rise Time <sup>2</sup>	t <sub>r</sub>			12		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			20		
Fall Time <sup>2</sup>	t <sub>f</sub>			13		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				25	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = 8A, V <sub>GS</sub> = 0V			1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 8A, dI <sub>F</sub> /dt = 100A / μS		30		nS
Reverse Recovery Charge	Q <sub>rr</sub>			16		nC

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

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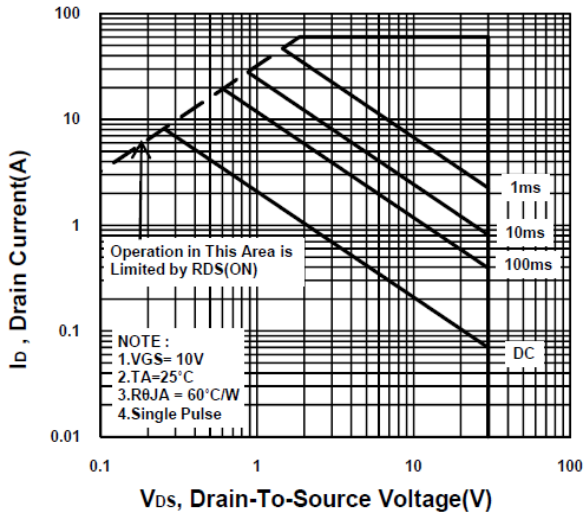
## N-Channel Enhancement Mode MOSFET



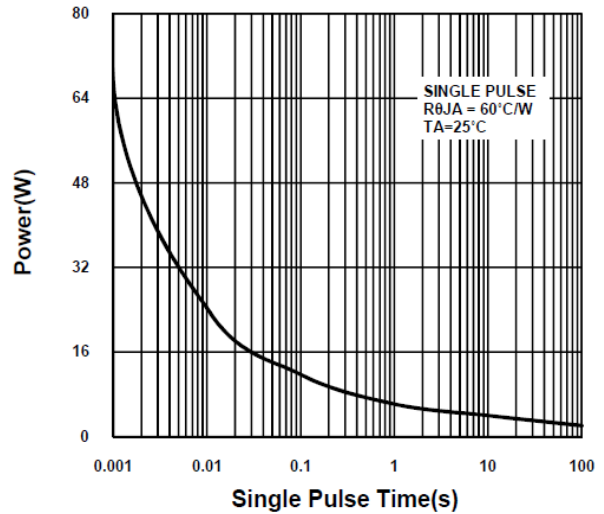
# P2003BEA

## N-Channel Enhancement Mode MOSFET

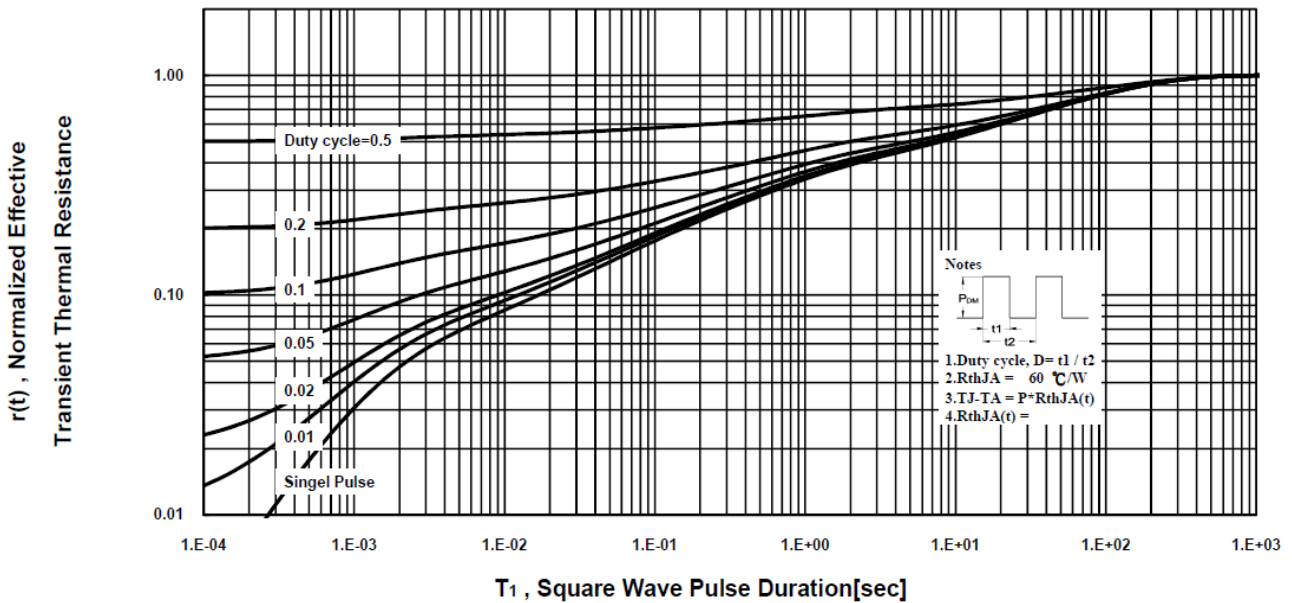
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



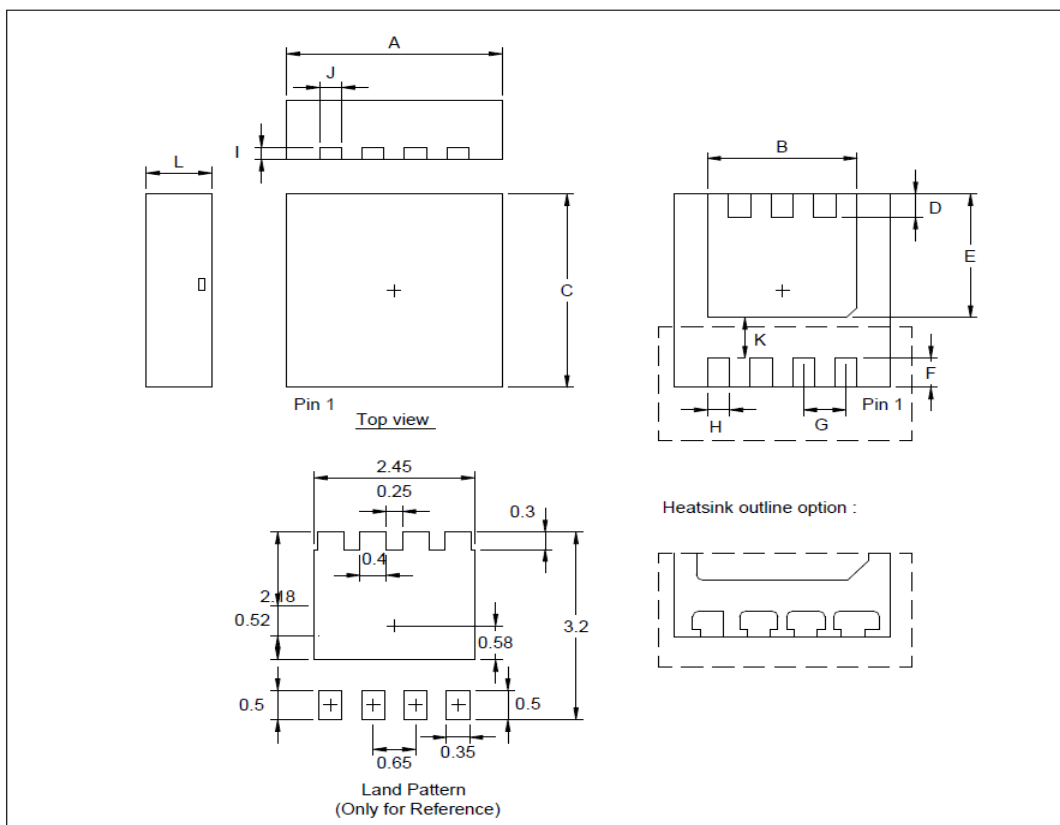
# P2003BEA

## N-Channel Enhancement Mode MOSFET

### Package Dimension

### PDFN 3x3S MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.9	3.0	3.1	I		0.20	
B	2.35	2.4	2.55	J	0.27	0.35	0.4
C	2.9	3.0	3.1	K		0.45	
D	0.32	0.4	0.45	L	0.7	0.8	0.9
E	2.0	2.1	2.2				
F	0.32	0.42	0.47				
G		0.65					
H	0.27	0.35	0.525				



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